

WHAT IS CLAIMED IS:

1. A fuel cell, comprising:
  - a first substrate having a first gas flow path formed therein that supplies a first reactive gas;
  - a first collector layer formed on the first substrate side thereof;
  - a first gas diffusion layer formed on the first substrate side thereof;
  - a first reactive layer formed on the first substrate side thereof;
  - a second substrate having a second gas flow path formed therein that supplies a second reactive gas;
  - a second collector layer formed on the second substrate side thereof;
  - a second gas diffusion layer formed on the second substrate side thereof;
  - a second reactive layer formed on the second substrate side thereof; and
  - an electrolyte membrane formed interposed between the first reactive layer and the second reactive layer, a width of an opening of at least one of the first gas flow path and the second gas flow path being smaller than a particle diameter of material constituting the first gas diffusion layer and the second gas diffusion layer.
2. The fuel cell as defined in Claim 1, a width of a bottom of the first gas flow path being greater than the width of the opening thereof, and a width of a bottom of the second gas flow path being greater than the width of the opening thereof.
3. A process for producing a fuel cell, comprising:
  - a first gas flow path forming step of forming a first gas flow path in the first substrate that supplies a first reactive gas;
  - a first collector layer forming step of forming a first collector layer;
  - a first gas diffusion layer forming step of forming a first gas diffusion layer;
  - a first reactive layer forming step of forming a first reactive layer;
  - an electrolyte membrane forming step of forming an electrolyte membrane;
  - a second reactive layer forming step of forming a second reactive layer;
  - a second gas diffusion layer forming step of forming a second gas diffusion layer;
  - a second collector layer forming step of forming a second collector layer; and
  - a second gas flow path forming step of forming a second gas flow path in the second substrate that supplies a second reactive gas,
  - at least one of the first gas flow path forming step and the second gas flow path forming step including forming a gas flow path an opening width of which is smaller

than a particle diameter of material constituting the first gas diffusion layer and the second gas diffusion layer using an ejection device.

4. The process for the production of a fuel cell as defined in Claim 3, the first gas flow path forming step including forming a first gas flow path a bottom width of which is greater than the opening width thereof and the second gas flow path forming step includes forming a second gas flow path a bottom width of which is greater than the opening width thereof.

5. A fuel cell, comprising:  
 a first substrate having a first gas flow path formed therein that supplies a first reactive gas;  
 a first collector layer formed on the first substrate side thereof;  
 a first gas diffusion layer formed on the first substrate side thereof;  
 a first reactive layer formed on the first substrate side thereof;  
 a second substrate having a second gas flow path formed therein that supplies a second reactive gas;  
 a second collector layer formed on the second substrate side thereof;  
 a second gas diffusion layer formed on the second substrate side thereof;  
 a second reactive layer formed on the second substrate side thereof; and  
 an electrolyte membrane formed interposed between the first reactive layer and the second reactive layer,  
 a width of at least one of the first gas flow path and the second gas flow path increasing gradually from upstream toward downstream.

6. The fuel cell as defined in Claim 5, the width of at least one of the first gas flow path and the second gas flow path being narrow at a downmost portion.

7. The fuel cell as defined in Claim 5, any of the first gas flow paths having a feed port at one end of the first substrate and a discharge port at another, and the remaining first gas flow paths have a discharge port at one end of the first substrate and a feed port at another, while any of the second gas flow paths has a feed port at one end of the second substrate and a discharge port at another, and the remaining second gas flow paths have a discharge port at one end of the second substrate and a feed port at another.

8. A process for the production of a fuel cell, comprising:  
 a first gas flow path forming step of forming a first gas flow path in the first substrate that supplies a first reactive gas;  
 a first collector layer forming step of forming a first collector layer;

a first gas diffusion layer forming step of forming a first gas diffusion layer;  
 a first reactive layer forming step of forming a first reactive layer;  
 an electrolyte membrane forming step of forming an electrolyte membrane;  
 a second reactive layer forming step of forming a second reactive layer;  
 a second gas diffusion layer forming step of forming a second gas diffusion layer;

a second collector layer forming step of forming a second collector layer; and  
 a second gas flow path forming step of forming a second gas flow path in the second substrate that supplies a second reactive gas,

at least one of the first gas flow path forming step and the second gas flow path forming step including forming a gas flow path, a width of which increases gradually from upstream toward downstream.

9. The process for the production of a fuel cell as described in Claim 8, at least one of the first gas flow path forming step and the second gas flow path forming step including forming a gas flow path the width of which is narrow at its downmost portion.

10. The process for the production of a fuel cell as defined in Claim 8, the first gas flow path forming step including forming first gas flow paths any of which has a feed port at one end of the first substrate and a discharge port at another and the remaining ones of which have a discharge port at one end of the first substrate and a feed port at another and the second gas flow path forming step comprises forming second gas flow paths any of which has a feed port at one end of the second substrate and a discharge port at another and the remaining ones of which have a discharge port at one end of the second substrate and a feed port at another.

11. The process for the production of a fuel cell as defined in Claim 8, at least one of the first gas flow path forming step and the second gas flow path forming step comprising forming a gas flow path the width of which increases gradually from upstream toward downstream using an ejection device.

12. A fuel cell, comprising:  
 a first substrate having a first gas flow path formed therein that supplies a first reactive gas;  
 a first collector layer formed on the first substrate side thereof;  
 a first gas diffusion layer formed on the first substrate side thereof;  
 a first reactive layer formed on the first substrate side thereof;

a second substrate having a second gas flow path formed therein that supplies a second reactive gas;

a second collector layer formed on the second substrate side thereof;

a second gas diffusion layer formed on the second substrate side thereof;

a second reactive layer formed on the second substrate side thereof and an electrolyte membrane formed interposed between the first reactive layer; and

the second reactive layer,

a width of at least one of the first gas flow path and the second gas flow path gradually decreases from an upper portion toward a bottom of the first or second gas flow path.

13. The fuel cell as defined in Claim 12, at least one of the first gas flow path and the second gas flow path having a curved section.

14. A process for the production of a fuel cell, comprising:

a first gas flow path forming step of forming a first gas flow path in the first substrate that supplies a first reactive gas;

a first collector layer forming step of forming a first collector layer;

a first gas diffusion layer forming step of forming a first gas diffusion layer;

a first reactive layer forming step of forming a first reactive layer;

an electrolyte membrane forming step of forming an electrolyte membrane;

a second reactive layer forming step of forming a second reactive layer;

a second gas diffusion layer forming step of forming a second gas diffusion layer;

a second collector layer forming step of forming a second collector layer; and

a second gas flow path forming step of forming a second gas flow path in the second substrate that supplies a second reactive gas,

at least one of the first gas flow path forming step and the second gas flow path forming step including forming a gas flow path, a width of which gradually decreases from an upper portion toward a bottom of the first or second gas flow path.

15. The process for the production of a fuel cell as defined in Claim 14, the first gas flow path forming step comprising a gas flow path-forming material spreading step of spreading a gas flow path-forming material over a surface of the first substrate and then forming a first gas flow path the width of which gradually decreases from the upper portion to the bottom of the first gas flow path in the gas flow path-forming material spread over the first substrate using a gas flow path-forming mold that forms a gas flow path, and the second

gas flow path forming step comprising a gas flow path-forming material spreading step of spreading a gas flow path-forming material over a surface of the second substrate and then forming a second gas flow path the width of which gradually decreases from the upper portion to the bottom of the second gas flow path in the gas flow path-forming material spread over the second substrate using a gas flow path-forming mold for forming a gas flow path.

16. The process for the production of a fuel cell as defined in Claim 14, at least one of the first gas flow path forming step and the second gas flow path forming step comprising forming a gas flow path having a semicircular section.